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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,355	04/12/2004	Robert Martinson	NOVE100042000/NVLS-2898	4719

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Delio & Peterson , LLC
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EXAMINER	
BAND, MICHAEL A	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
11/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/823,355	MARTINSON ET AL.	
	Examiner	Art Unit	
	MICHAEL BAND	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 13-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/26/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Reopening of Prosecution

1. The Examiner has specific knowledge of the existence of a particular reference (i.e. US Patent No. 5,589,224) which indicates nonpatentability of any of the appealed claims as to which the Examiner was reversed and thus, requests authorization from the Technology Center Director to reopen prosecution under 37 CFR 1.198 for the purpose of entering the new rejection. See MPEP §1214.04, §1002.02(c), and MPEP §1214.07.

/M. B./

Examiner, Art Unit 1795

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

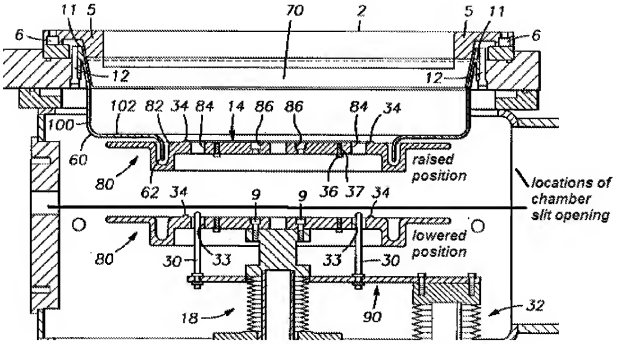
> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-9 and 13-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tepman et al (US Patent No. 5,589,224).

With respect to claims 1-2, 13-15, and 20, Tepman et al discloses an apparatus for full wafer deposition with a sidewall shield arrangement that prevents deposition in the area of a chamber surrounding a substrate (i.e. wafer) (abstract). Tepman et al

further discloses in fig. 5 the chamber [2] comprises lower, side, and upper walls, a lifter apparatus [90] for moving a pedestal (i.e. elevator) [18] between a lower unloading position and a raised deposition position, and a sputter target [70] above said pedestal [18]. Tepman et al also discloses that the pedestal shield [82] is attachable to the pedestal [18] (col. 6, lines 16-21). Fig. 5 further depicts the pedestal [18] having an extended segment (i.e. pedestal shield) [82] that is movable between the raised position and lowered position, with said extended segment [82] having an outwardly and downwardly extending portion surrounding and extending from said pedestal [18] toward the chamber [2] lower walls and an outwardly and upwardly curving end extending toward said chamber [2] side walls. Fig. 5 also depicts a sidewall shield [60] comprises a cylindrical portion [100] that extends around and within the chamber sidewalls along with downward from an upper portion, said sidewall shield [60] having a curved inwardly and downwardly extending portion with a lower end [62] disposed below an upper portion of the pedestal shield [82] when said pedestal [18] is raised. Fig. 5 further depicts that the lower end [62] is above the pedestal [18] when said pedestal [18] is in the lowered position a distance sufficient to permit a wafer (i.e. substrate) to be horizontally loaded onto said pedestal [18] via slit valve-controlled opening in chamber wall (col. 5, lines 20-49), with said pedestal shield [82] and said sidewall shield [100] cooperating when the pedestal [18] is in the raised position to prevent line-of-sight deposition from the sputter target [70] or gas-scattered transmission of deposition from said sputter target [70] to the side and lower walls of the chamber [2] in addition to preventing line-of-sight or gas-scattered transmission of deposition from sides of the

pedestal shield [82] facing the chamber upper walls to the side and lower walls of said chamber [2]. The cropped figure below of fig. 5 serves to further clarify the raised position, the lowered position, the shields 60], [82] avoiding contact with each other, and a robot blade for horizontally transporting the wafer (i.e. substrate) into and out of the chamber [2].



With respect to claims 3-5 and 16, Tepman et al further discloses in fig. 5 the sidewall shield [60] having the lower end [62] disposed below and outward of an upper surface plane of the pedestal shield [82] when said pedestal [18] is raised, with fig. 5 also depicting the pedestal shield [82] having the upper portion surrounding said pedestal [18] and having an outwardly and downwardly extending portion surrounding and extending from said pedestal [18] toward the chamber [2] lower walls. Fig. 5 further

depicts the sidewall shield [60] having the lower end [62] disposed below and outward of the upper surface of the pedestal shield [82] in addition to said lower end [62] being inward of the outward portion of said pedestal shield [82] when the pedestal [18] is raised.

With respect to claims 6-8 and 17-19, Tepman et al further discloses in fig. 5 the pedestal shield [82] having an upper portion surrounding the pedestal [18] and a lower portion extending downward toward the chamber lower wall and an outward portion extending upward and away from said lower portion, with the sidewall shield [60] having a lower end disposed outward of said upper portion of said pedestal shield [82] and inward of said outward portion of said pedestal shield when said pedestal [18] is in the raised position. Fig. 5 also depicts the sidewall shield [60] having an outward portion [102] between the sidewall of the chamber [2] and the lower end of said sidewall shield [60], where said outward portion [102] is disposed outward of the outward portion of the pedestal shield [82] when the pedestal [18] is in the raised position.

With respect to claim 9, Tepman et al further depicts in fig. 5 the sidewall shield [60] having the lower end that is above the pedestal shield [82] when the pedestal [18] is in the raised position, where said pedestal shield [82] extends outward from said pedestal [18] toward sidewalls of the chamber [2] and below said lower end of said sidewall shield [60].

Claim Rejections - 35 USC § 103

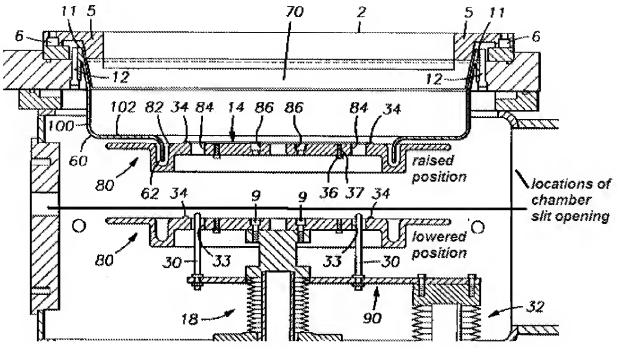
4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-11 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al (US Patent No. 5,589,224) in view of Chung et al (US Patent No. 6,171,453).

With respect to claims 1-2, 13-15, and 20, Tepman et al discloses an apparatus for full wafer deposition with a sidewall shield arrangement that prevents deposition in the area of a chamber surrounding a substrate (i.e. wafer) (abstract). Tepman et al further discloses in fig. 5 the chamber [2] comprises lower, side, and upper walls, a lifter apparatus [90] for moving a pedestal [80] between a lower unloading position and a raised deposition position, and a sputter target [70] above said pedestal [80]. Fig. 5 further depicts the pedestal [80] having an extended segment (i.e. pedestal shield) [82] that is movable between the raised position and lowered position, with said extended segment [82] having an outwardly and downwardly extending portion surrounding and extending from said pedestal [80] toward the chamber [2] lower walls and an outwardly and upwardly curving end extending toward said chamber [2] side walls. Fig. 5 also depicts a sidewall shield [60] comprises a cylindrical portion [100] that extends around and within the chamber sidewalls along with downward from an upper portion, said sidewall shield [60] having a curved inwardly and downwardly extending portion with a

lower end [62] disposed below an upper portion of the pedestal shield [82] when said pedestal [80] is raised. Fig. 5 further depicts that the lower end [62] is above the pedestal [80] when said pedestal [80] is in the lowered position a distance sufficient to permit a wafer (i.e. substrate) to be horizontally loaded onto said pedestal [80] via slit valve-controlled opening in chamber wall (col. 5, lines 20-49), with said pedestal shield [82] and said sidewall shield [100] cooperating when the pedestal [80] is in the raised position to prevent line-of-sight deposition from the sputter target [70] or gas-scattered transmission of deposition from said sputter target [70] to the side and lower walls of the chamber [2] in addition to preventing line-of-sight or gas-scattered transmission of deposition from sides of the pedestal shield [82] facing the chamber upper walls to the side and lower walls of said chamber [2]. The cropped figure below of fig. 5 serves to further clarify the raised position, the lowered position, the shields 60], [82] avoiding contact with each other, and a robot blade for horizontally transporting the wafer (i.e. substrate) into and out of the chamber [2].



However Tepman et al is limited in that the pedestal shield being attachable to the pedestal is not suggested.

Chung et al further teaches a sidewall shield [48] used for physical vapor deposition with a pedestal [82] having a pedestal shield [84] capable of moving up and down inside a deposition chamber [80] (abstract; figs. 6A-6B). Figs. 6A-6B depict the sidewall shield [48] having an extension to a lower end that extends below the pedestal [82] and forms a bottom wall shield (i.e. inward portion) that extends along a lower wall of the deposition chamber [80], with said bottom wall shield extending upward with a lower portion of the pedestal shield [84] between said extension and said bottom wall shield. Chung et al also teaches the pedestal shield [84] being attachable to the pedestal [82] (col. 6, lines 59-64).

It would have been obvious to one of ordinary skill in the to substitute the two-piece pedestal shield and pedestal as taught by Chung et al in place the single-piece

pedestal shield and pedestal of Tepman et al to attain the predictable result of blocking line-of-sight to prevent deposition particles from depositing on the chamber sidewalls and bottom. It further would have been obvious to one of ordinary skill in the art to have the pedestal shield attachable (i.e. removable) to the pedestal since it has been held that if it were desirable for any reason to obtain access to the pedestal, it would be obvious to make the pedestal shield removable for that purpose. See MPEP 2144.04, Section V, Part C. In this case, it is desirable to remove only the pedestal shield in order to replace or clean said pedestal shield due to deposited material while leaving the pedestal in place, thus it is obvious to make said pedestal shield removable. It further would have been obvious to one of ordinary skill in the art to use the two-piece pedestal shield and pedestal taught by Chung et al to prevent deposition particles from depositing on the chamber sidewalls and bottom as taught by Tepman et al since using a known technique of pedestal shields for preventing deposition material accumulating on the chamber sidewalls and bottom is desired in Tepman et al. It further would have been obvious to one of ordinary skill in the art to try using the two-piece arrangement of Chung et al in attempt to improve the single-piece arrangement of Tepman et al, as a person with ordinary skill has god reason to pursue the known options within his or her technical grasp since the pedestal shield is either permanently attached to the pedestal (i.e. single-piece) or removable (i.e. two-piece).

With respect to claims 3-5 and 16, modified Tepman et al further discloses in fig. 5 the sidewall shield [60] having the lower end [62] disposed below and outward of an upper surface plane of the pedestal shield [82] when said pedestal [80] is raised, with

fig. 5 also depicting the pedestal shield [82] having the upper portion surrounding said pedestal [80] and having an outwardly and downwardly extending portion surrounding and extending from said pedestal [80] toward the chamber [2] lower walls. Fig. 5 further depicts the sidewall shield [60] having the lower end [62] disposed below and outward of the upper surface of the pedestal shield [82] in addition to said lower end [62] being inward of the outward portion of said pedestal shield [82] when the pedestal [80] is raised.

With respect to claims 6-8 and 17-19, modified Tepman et al further discloses in fig. 5 the pedestal shield [82] having an upper portion surrounding the pedestal [80] and a lower portion extending downward toward the chamber lower wall and an outward portion extending upward and away from said lower portion, with the sidewall shield [60] having a lower end disposed outward of said upper portion of said pedestal shield [82] and inward of said outward portion of said pedestal shield when said pedestal [80] is in the raised position. Fig. 5 also depicts the sidewall shield [60] having an outward portion [102] between the sidewall of the chamber [2] and the lower end of said sidewall shield [60], where said outward portion [102] is disposed outward of the outward portion of the pedestal shield [82] when the pedestal [80] is in the raised position.

With respect to claim 9, modified Tepman et al further depicts in fig. 5 the sidewall shield [60] having the lower end that is above the pedestal shield [82] when the pedestal [80] is in the raised position, where said pedestal shield [82] extends outward from said pedestal [80] toward sidewalls of the chamber [2] and below said lower end of said sidewall shield [60].

With respect to claims 10-11, Chung et al further teaches a sidewall shield [48] used for physical vapor deposition with a pedestal [82] having a pedestal shield [84] capable of moving up and down inside a deposition chamber [80] (abstract; figs. 6A-6B). Figs. 6A-6B depict the sidewall shield [48] having an extension to a lower end that extends below the pedestal [82] and forms a bottom wall shield (i.e. inward portion) that extends along a lower wall of the deposition chamber [80], with said bottom wall shield extending upward with a lower portion of the pedestal shield [84] between said extension and said bottom wall shield. Figs. 6A-6B also depict the bottom wall shield having a lower portion extending along the lower wall, and inward and outward portions extending upward from the bottom shield lower portion, with said bottom wall shield inward portion extending inward of the pedestal shield [88] lower portion and the bottom wall shield outward portion extending outward of the pedestal shield [84] lower portion.

6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tepman et al (US Patent No. 5,589,224) as applied to claim 1 above, and further in view of Chung et al (US Patent No. 6,171,453).

With respect to claims 10-11, the reference is cited as discussed for claim 1. Tepman et al further discloses in fig. 5 the pedestal shield [82] having an upper portion surrounding the pedestal [80] and a lower portion extending downward toward the chamber lower wall. However Tepman et al is limited in that it is not suggested to have the lower end of the sidewall shield [60] have a extension on said lower end or a bottom wall shield.

Chung et al teaches a sidewall shield [48] used for physical vapor deposition with a pedestal [82] having a pedestal shield [84] capable of moving up and down inside a deposition chamber [80] (abstract; figs. 6A-6B). Figs. 6A-6B depict the sidewall shield [48] having an extension to a lower end that extends below the pedestal [82] and forms a bottom wall shield (i.e. inward portion) that extends along a lower wall of the deposition chamber [80], with said bottom wall shield extending upward with a lower portion of the pedestal shield [84] between said extension and said bottom wall shield. Figs. 6A-6B also depict the bottom wall shield having a lower portion extending along the lower wall, and inward and outward portions extending upward from the bottom shield lower portion, with said bottom wall shield inward portion extending inward of the pedestal shield [88] lower portion and the bottom wall shield outward portion extending outward of the pedestal shield [84] lower portion.

It would have been obvious to one of ordinary skill in the art to incorporate the lower end extension or bottom shield wall from the sidewall shield taught by Chung et al into the sidewall shield of Tepman et al to attain the predictable results of preventing deposition particles from a sputter target above from reaching sidewalls and lower walls of the chamber. In addition it would have been obvious to one of ordinary skill in the art to incorporate the lower end extension or bottom shield wall from the sidewall shield taught by Chung et al into the sidewall shield of Tepman et al since using the known device of sidewall shield extension that extends below a pedestal in a physical vapor deposition apparatus in order to prevent deposition particles from depositing on chamber walls would have been obvious to one of ordinary skill.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

/Jennifer K. Michener/

Supervisory Patent Examiner, Art Unit 1795

/Gregory L Mills/
Supervisory Patent Examiner, Art Unit 1700
Director's Designee – reopening approved